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## Commentary

# A Commentary: The pandemic is calling for effective personal protection through innate immunological boosting

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## Abstract

It is logical to rely on effective vaccinations to overcome the pandemic as well as future up-coming epidemics. When the scale of involvement and the speed of spread are unusually wide and extensive, as is happening in the current Pandemic, vaccination cannot effectively satisfy the expectations.

Innate Immunity of the individual determines whether he or she is more resistant to infection, or on the contrary, more susceptible. A strong background of innate immunological defense ability allows the individual to resist infection and, even if infected will be able to maintain a mild course.

Recent studies have indicated that Innate Immunity could be "trained" to arrive at a more effective and more sustained ability to resist incoming adverse organisms: though short of specificity like vaccination, yet could provide a general combatting coverage, from the stage of early organism entry to the subsequent fight for elimination. Research has identified that micro-nutrients in food stuffs and special lipo- or glyco-proteins could provide enhancements in the perfect maintenance of the Immunological System to provide an ideal ground for "trained immunity" development.

Since Vitamin D has long been revealed being protective against respiratory infections via rather sophisticated pathways, it is suggested that it could be combined with other micro nutrients like  $\beta$  glycan to form an effective Innate Immunity booster in support of specific vaccination.

## Introduction

Since the third week of April 2021, India has been experiencing the most disastrous attack of the COVID-19 pandemic. The daily over 300,000 infection victims and over 3,000 mortalities are shocking the whole world.

The apparent total loss of control has been attributed to complicated issues related to virological science, public health management and social inequalities [1]. On the scientific area, the COVID-19 affecting India has been discovered to have undergone double or triple variant conversions resulting in more virulence and more rapid speed of spread. The sudden exacerbation of the Pandemic in India happened after the

relaxation of the public health restriction measures: avoid gatherings, isolations, distancings, putting on masks etc. For some reasons, although India has been a great manufacturing source of vaccine production, nevertheless only about 2% of its population has been vaccinated. On the social inequality side, poverty in some areas could have been affecting hospitalization and normal clinical care, which sadly manifested as oxygen deprivation and other shortages.

The desperate situation might also indicate that some individuals might be more vulnerable than the average fellow citizens. Within the pandemic area, some individuals could be more resistant whereas some others could be more vulnerable because of their inferior innate defense ability.

We used to identify special geographic areas in the world as being enthusiastic in the consumption of traditional nutritive supplements like the use of medicinal herbs, together with popular practices of special exercises. These regions should command better chances of protection against invading infections. With India's Ayurvedic medicine and Yoga practice, it should be in a favourable position. Indeed, when the 1918 influenza pandemic attacked the whole world, reports from China, another country fervently using traditional herbal medicine and special exercise like Tai Chi had apparently suffered less, manifested as fewer people infected and lower mortality [2].

### Traditional Indian medicine and covid-19 pandemic

There is the Ministry of AYUSH in the Indian government which is responsible for the job of promoting Traditional Indian Medicine. AYUSH stands for the five popular clinical traditions: Ayurveda, Yoga, Unani, Siddha and Homeopathy. The Indian Government in May 2020, has suggested measures that included the use of a formula consisting of Ginger, Curcumin, Cloves, Honey, Fennel, Cumin etc, called "Kadha" as an immunity booster [3]. Pharmacological and non-pharmacological instruction are advocated in Ayurveda for infection control [4]. Some Ayurvedic herbal preparations containing garlic, turmeric, carom and ajain have been used as oral disinfectant against COVID-19. Research has started on the use of Ayurvedic medicine for the pandemic [5]. Specific anti-flu preparations using Arsenicum album and Bryonia have also been in active use and popular [6,7].

Combined use of hydroxychloroquine and homeopathic medicine is widely practiced in Pune area, Indian, in the hospitals and more importantly, the combination has been given to over 2,000 people under quarantine. Gujrat government has issued guidelines on the use of Ayurvedic medicine as immune boosters [8]. The government of Kerala interlinked the framework of Traditional Indian Medicine with the public health administrative system to overcome the pandemic. The refined directives include the use of "Sukhayusham" for the elderlies; "Swasthyam" for the under 60's; as well as using the Ayur Raksha Clinic to help the recovering patients [10]. For the symptom-free isolated people a number of specific preventive herbal formulae were successfully given [11-13].

Dr. Abhishek Shanker and experts from Delhi, India, have reported in detail the current situation of Traditional Indian Medicine being used for the prevention and treatment of COVID-19 in India [14]. The active practice on Traditional Indian Medicine for prevention and treatment resembles very much what is happening in China today since the out-break in December 2019. Experts in China did very much related the popular use of Chinese herbal medicine to a better prevention and control of the pandemic [15,16].

### Is there a role for herbal medicine to be used for personal defense?

In spite of the rather energetic support over the use of Ayurveda Medicine in India, the alarming spread of the COVID-19 infection has not been prevented. One might argue

that social distancing and vaccinations are far more important and specific for prevention, and that when aggressive mutations occur, little can be done.

On the other hand, we have to agree that in spite of the aggressiveness and extensive coverage of the infection, some (or a lot) still manage to resist the infection and defend themselves. The personal level of protection with or without special vaccination cannot be ignored.

Looking around the world, the less developed countries and regions are relying significantly on herbal medicine.

Cuba among the Caribians is unique. Homeopathic medicine 'Prevengho-VIR' is used in Cuba for COVID-19 patients as preventive agent [18]. Large-scale homeoprophylaxis has been going on since 2020 and the low infection rate has been very impressive [19,20].

Many African countries widely use traditional herbals against various infections [21,22]. Earlier in 2020 Madagascar widely advocated herbal "COVID-ORGANICS" (Ayurveda "Rajoelina") for COVID-19 prevention and treatment [22].

In the Asian counties and regions like Korea, Japan, China, Taiwan, Singapore and Malaysia, Tradition Herbal Medicine is also widely practiced, which may partially explain the relatively better controlled situations in the Pandemic, attributed very much to personal protection practices.

### A general framework for a wider preventive strategy

The lessons we might have learned from South Asia include: that a new infection could behave extremely unexpectedly, so that the causative agent freely changes; public health measures might not be perfect and might not last; citizens might not conform to regulations; vaccines might not be available and if available, might not be adequately distributed. Under normal circumstances, those well-nourished and regularly exercising, might be taking supportive health supplements, like the South Asians, should be more capable to defend themselves against invading organisms; yet in an epidemic or pandemic, some of the less prepared still succumb.

Public Health measures are crucial and decisive in a pandemic. The value of the restrictions is best felt among those already well prepared with sufficient innate protections against the infection, compared with those not prepared. To achieve this the individual needs to maintain the perfect integrity of his/her Immune Defense System, which might require special up-boosting in time of need. What are the requirements? Nutrition is the determinant factor for the maintenance of general homeostasis and immune function. Special nutrients particularly Vitamin D are essential components to act as a booster [23,24]. Some food substances like glycoproteins and lipoproteins in the course of immunological research studies have been identified as being supportive in the promotion of innate immunological defense. Typical examples have been found in selective medicinal herbs commonly used in Traditional Chinese Medicine and Ayurveda Medicine [25-27].

The link between respiratory infections and Vitamin D has long been found [28]. The double roles of vitamin D include firstly, induction of the production of antiviral peptides such as cathelicidin in the respiratory epithelium which strengthens mucosal defense [29]. Secondly, it reduces cytokine production by enhancing the innate immune system and suppressing the over-activation of the adaptive immune system secondary to viral load [30].

With regard to medicinal herbs containing nutrients expressing appropriate immune-boosting effects, there are plentiful scientific publications giving objective evaluations related to laboratory evidences and clinical value [31,32]. Indeed, the herbs have been widely used in the past epidemics that happened in China and India since ancient days. However, one has yet to find these immune boosters to be used together with special nutrients like Vitamin D. The combination could possibly be shown to have synergistic effects, thus creating an innovative innate immunological booster for the therapeutic training of the immune system [33,34].

## Conclusion

Before the start of the Pandemic, Harvard scholars brought to the Medical Public an important message: that Vitamin D could be recommended for the prevention of respiratory tract infection. Clinical and public health data, together with results of laboratory research were considered sufficient for the advocacy. On the practical observations of winter and spring time respiratory infections, Northern countries and districts which were deficient of sunlight, thus negatively affecting the natural production of Vitamin D, suffered more incidences [23].

Compelling evidences from *in-vitro* experiments demonstrated that Vitamin D could act as a potent stimulator of innate antimicrobial responses [35,36]. Analysis of macrophage function through *ex-vivo* studies showed that supplementation with a single oral dose of Vitamin D enhanced donor macrophage responses to Bacillus infection [37]. Other laboratory evidences include that Vitamin D modulates the inflammatory responses to infection, regulates the renin-angiotensin system [38].

Vitamin D receptors are present in most tissues throughout the body. This fact sets the stage that Vitamin D is a very much wanted micro-nutritional component in the human body expected to get involved in a number of metabolic and homeostatic activities, from the widely known calcium metabolism to the less known immune-supportive and anti-infection areas. Deficiency is certainly harmful. Whether extra-supplements is beneficial is a logical assumption although more solid scientific proof is yet being awaited [24].

While Vitamin D should be considered an important nutrient with excellent innate mechanisms of support in normal tissues to promote its role in immunological defense, if at the same time, another supportive nutritional could be provided from outside, double enhancing effects could be expected.

In our discussion, we proposed medicinal herbs which contain unique polysaccharides widely known as  $\beta$  glycans.

The glycan-containing medicinal plants include special mushrooms like the coriolus species and gonoderma species. A few other medicinal plant roots have likewise been discovered to contain special glycoproteins and or lipoproteins that have been shown to have immune-boosting effects [39]. The word “Immunoceuticals” has been conveniently used to describe this group of supplements.

Practitioners in Traditional Medicine, (both Indian and Chinese) own valuable experiences and expertise in the use of immunoceuticals, but their philosophy and choices differ significantly. Decades ago, and in traditional classics, their expectations concentrate on infection control and prevention [40]. In reason years much interests have been diverted to cancer control (41). More and more evidences are collected from research platforms on the mechanisms driving the immune-boosting effects of the selected herbal products.

Natea developed a new concept he called “trained immunity”. He found that past vaccination of any kind or a current infection could affect monocytes/ macrophages to undergo a functional re-programming so that an enhanced defensive response against future invasion of unrelated organism can be displayed. Laboratory animal experiments of *Candida albicans* and other infections also demonstrated that the animals develop resistance against re-infection via the functional reprogramming of monocytes. Moreover,  $\beta$  glycans enhanced the “trained immunity” effects [42,43].

Vitamin D may protect against invading infections as an ever-ready sentinel which may require further strengthening. Immunoceuticals could selectively come in to reinforce the defense, providing additional and possibly synergistic effects [44].

This might be a suitable time, for the well-known aspects of the innate immunological defense be seriously studied and be included into the immediate future planning, against epidemics, which should not be confined to specific vaccine development but could include the therapeutic personal protection against aggressive infections, basing on innate immunity [45,46].

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